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Author: Katarzyna Dąbrowska-Zapart, Kazimiera Chłopek, Mariola Jabłońska, Mieczysław Leśniok, Ewa Krakowiak

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Variability in the concentration and composition of pollen grains and atmospheric dusts and their impact on human health in Sosnowiec

Katarzyna Dąbrowska-Zapart¹, Kazimiera Chłopek¹, Mariola Jabłońska²,
Mieczysław Leśniok³ & Ewa Krakowiak⁴

¹Department of Paleontology and Stratigraphy, Faculty of Geosciences, Silesian University; ²Department of Geochemistry, Mineralogy and Petrography, Faculty of Geosciences, Silesian University; ³Department of Climatology, Faculty of Geosciences, Silesian University; ⁴Institute of Occupational Medicine and Environmental Health in Sosnowiec, Poland

Airborne allergy is an important problem in terms of public health, both in Europe and Poland. Symptoms occur in allergic persons every year with varied severity depending on the aeroallergens concentration in the air. Increased number of airborne allergies was stated in urbanized areas, which is associated with higher air pollution. Environmental pollution has a significant impact on the growth of allergic diseases. Organic and inorganic substances, motor exhaust fumes accumulate on the surface of pollen grains and are inhaled with them.

Surveys of respiratory disease symptoms were conducted among children aged from 7 to 13 years who attended primary school (I-VI class), from October 2012 to August 2013. Allergologists from the Institute of Occupational Medicine and Environmental Health in Sosnowiec, based on the available literature, domestic and foreign sources, and based on their own medical experience have developed a Symptoms Card of the Respiratory Tract, which is self-observation questionnaire of reported problems. Alongside questionnaire forms, the concentration measurement of pollen grains and collection of samples of dust particles PM10 in Sosnowiec was carried out. Test points and the school are in the same district.

Allergy symptoms from the respiratory tract occurred with varied severity during the research period. The most commonly reported symptoms include: blocking the nose, leaking watery secretions from the nose, and coughing. Exacerbation of symptoms in children was found in November, December 2012, January,

April and June 2013. Allergic symptoms in the autumn-winter period were caused by high concentration of dust particles PM10. The particles composition consisted of soot units that were composed of calcium sulphate (mostly gypsum), chloride sodium and ammonium chloride (salmiac). Sharp-edged grains of quartz, and balls of aluminosilicate enamel were found in smaller quantities

In the spring-summer period, the cause of the reported problems was plant pollen. April is a period of intensive blooming of trees (alder, birch, ash tree). After the 5th April 2013, an increase of symptoms was recorded. It was a period of intensive blooming of alder tree, cypress and birch. June is a period of grass and ryes blooming. The first half of June was characterized by the largest occurrence, after November 2012, of negative symptoms of respiratory system ailments caused by the exposure to the pollen of grasses and rye. In July 2013, fewer symptoms throughout the research period were reported, while in August 2013, between 15th and 20th, a sudden increase in the recorded symptoms caused by exposure to the pollen of Mugwort and ragweed were observed.

Research in the group of children aged 7-13, from Pogoń district in Sosnowiec indicated a high incidence of allergies to grass pollen and birch allergens, as well as to ammonium chloride (salmiac).

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